In the Claims

The following represent marked-up versions of the amendments made to the claims. Applicants have provided all of the claims, amended or not, to avoid confusion in the event of future prosecution.

1. (Twice Amended) A Coriolis flowmeter [capable of use as a vibrating densitometer] which measures densities of materials including combinations of gas and liquids, gas and solids, or solids and liquids, said flowmeter comprising:

at least one flowtube;

a driver that vibrates said at least one flowtube at a fundamental frequency based on a drive signal, said fundamental frequency corresponding to a density of material flowing through said at least one flowtube;

pickoffs affixed to said at least one flowtube that generate pickoff signals responsive to said material flowing through said at least one flowtube; and

meter electronics configured to:

determine said density of said material flowing through said at least one flowtube based on at least one of said pickoff signals,

monitor a drive gain in said at least one flow tube for a change in value to determine if said material flowing through said at least one flowtube comprises a multiphase flow, and

if said material flowing through said at least one flowtube comprises a multiphase flow, then determine said density of said material flowing through said at least one flowtube based on a stored density value.

[means for monitoring drive gain in vibrating said at least one flowtube for a change in value to determine an existence of a multiphase flow through said at least one flowtube; and

means responsive to an existence of said multiphase flow in said at least one flowtube for outputting a corrected density value.]

2. (Twice Amended) The flowmeter as set forth in claim 1 wherein said [means for monitoring includes means for for determining] meter electronics is

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further configured to determine whether said drive gain exceeds a first threshold value to determine if said material flowing through said at least one flowtube comprises [as an indicator of] said multiphase flow.

3. (Twice Amended) The flowmeter as set forth in claim 2 wherein said first threshold value represents that said [is indicative of a first type of] multiphase flow includes [including] gas and liquids.

4. (Twice Amended) The flowmeter as set forth in claim 3 wherein said [means for monitoring means includes means for determining] meter electronics is further configured to determine whether said drive gain exceeds a second threshold value, said second threshold value represents that [which indicates] said multiphase flow includes liquid and solid matter.

5. (Cancel) The flowmeter as set forth in claim 1 wherein said means for providing said corrected density value includes means for providing a new density value other than a density value corresponding to said fundamental frequency.

6. (Cancelled) The flowmeter as set forth in claim 5 wherein said providing means includes means for retrieving data representative of historical density measurements form said flowtube for use as said other density value.

7. (Twice Amended) The flowmeter as set forth in claim 1 [5] wherein said [means for providing said new density value comprises means for] meter electronics is further configured to average [averaging] historical density measurements over an interval of time to determine said [provide an average] density [value] if said material flowing through said at least one flowtube comprises said multiphase flow.

8. (Amended) The flowmeter as set forth in claim 7 wherein said meter electronics is further configured to apply a statistical analysis to said historical

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density measurements [are subjected to statistical analysis] to eliminate or reduce spurious measurements [from being included in said average density value].

9. (Twice Amended) The flowmeter as set forth in claim 1 wherein said [means for outputting said corrected density values] meter electronics is further configured to process [provides data representative of] density measurements obtained from laboratory measurements to determine [as] said [corrected] density [value] if said material flowing through said at least one flowtube comprises said multiphase flow.

10. (Twice Amended) The flowmeter as set forth in claim 1 wherein said [means for outputting] meter electronics is further configured to process correlations to determine said density [provides data representative of density measurements obtained from a correlation for use as said corrected density value] if said material flowing through said at least one flowtube comprises said multiphase flow.

11. (Twice Amended) The flowmeter as set forth in claim 1 [wherein said flowmeter is operably coupled with a producing well for the conduct of measurements upon fluid flowing from said well, said flowmeter] further comprising:

circuitry configured to close a valve to stop a well test in progress on a fluid [upon production] flowing from a production [said] well.

12. (Twice Amended) The flowmeter as set forth in claim 1 [wherein said flowmeter is operably coupled with a producing well for the conduct of measurements upon fluid flowing from said well, said flowmeter] further comprising [comprises]:

means for indicating an alarm indicative of said multiphase flow.

13. (Cancel) The flowmeter as set forth in claim 1 wherein said responding means includes means for providing drive gain as a meter output.

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14. (Twice Amended) A method of operating a Coriolis flowmeter [as a vibrating tube densitometer] to measure densities of materials [for material including a multiphase flow], said method comprising the steps of:

vibrating at least one flowtube of said [a] Coriolis flowmeter at a fundamental frequency corresponding to a density of material flowing through said at least one flowtube;

generating pickoff signals that represent motion of said at least one flow tube as said material flows through said at least one flowtube;

determining said density of said material flowing through said at least one flowtube based on at least one of said pickoff signals;

monitoring a drive gain in [vibrating] said at least one flowtube for a change in value to determine if said material flowing through said at least one flowtube [an existence of] comprises a multiphase flow [through said flowtube]; and

if said material flowing through said at least one flowtube comprises said multiphase flow, then determining said density of said material flowing through said at least one flowtube based on a stored density value.

[outputting a corrected density value responsive to a determination of said existence of multiphase flow in said flowtube.]

15. (Amended) The method as set forth in claim 14 wherein said step of monitoring said drive gain includes comparing said drive gain to a first threshold value to determine if said drive gain exceeds said first threshold value to determine if said material flowing through said at least one flowtube comprises [as an indicator of] said multiphase flow.

16. (Amended) The method as set forth in claim 15 wherein said step of comparing includes setting said first threshold value to represent that [as an indicator of] said multiphase flow includes [including] gas and liquids.

17. (Amended) The method as set forth in claim 16 wherein said step of comparing includes setting said second threshold value to represent that said multiphase flow includes liquids and solid matter and comparing said drive gain to

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said [a] second threshold value to determine whether [if] said drive gain exceeds said second threshold value [as an indicator of multiphase flow including liquid and solid matter].

18. (Cancelled) The method as set forth in claim 14 wherein said step of responding includes providing a density value other than a density value corresponding to said fundamental frequency.

19. (Cancel) The method as set forth in claim 14 wherein said step of outputting adjusting said measured density value includes a step of processing retrieving data representative of historical density measurements from said flowtube for use as said corrected density value.

20. (Amended) The method as set forth in claim 14 [19] wherein said step of determining said density of said material flowing through said at least one flowtube based on said stored density value further includes [including] a step of averaging [said] historical density measurements [are averaged] over an interval of time to [provide an average] to determine said density [value].

21. (Amended) The method as set forth in claim 20 wherein said step of averaging said historical density measurements further includes [including] a step of applying a statistical analysis to [subjecting] said historical density measurements [to statistical analysis] to eliminate or reduce spurious measurements [from being included in said average density value].

22. Amended) The method as set forth in claim 14 [18] wherein said step of determining said density of said material flowing through said at least one flowtube based on said stored density value further includes processing density measurements obtained from laboratory measurements to determine said density [said providing means includes means for retrieving data representative of density measurements obtained from laboratory measurements for use as said other density value].

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23. (Amended) The method [flowmeter] as set forth in claim 14 [18] wherein said step of determining said density of said material flowing through said at least one flowtube based on said stored density value further includes processing correlations to determine said density [providing means includes means for retrieving data representative of density measurements obtained from a correlation for use as said other density value].

24. (Withdrawn) A product comprising:

instructions operational when executed by a processor to direct the processor to receive drive gain inputs from a Coriolis meter and process the drive gain inputs, process the drive gain inputs to determine the existence of multiphase flow through said Coriolis flowmeter by comparing said drive gain inputs against a threshold value indicative of multiphase flow, and

providing outputs including a historical density value not representative of actual density measurements for the duration of said multiphase flow; and

a storage medium operational to store said instructions.

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